

10/552 203

The following is a complete listing of claims in this application.

1. (currently amended) Magnetic sensor to determine the position of a cellular phone (2) in linear movement along an axis of translation (T), the sensor comprising:

a magnetic circuit within which at least a magnetic induction ( $I_1$ ,  $I_2$ ) is created along a direction perpendicular to the axis;

a measuring cell fitted to a magnetic circuit, sensitive to the value of the magnetic induction flux and capable of measuring the variations in the value of the magnetic induction flux consecutive with the reluctance variations of the magnetic circuit in order to determine the linear position of the cellular phone (2) along the axis of translation (T); and

~~characterised in that it comprises~~ a single delimiting fixed magnetic circuit between two fixed pole parts, comprising:

a variable air gap (4) within which at least a magnetic induction ( $I_1$ ,  $I_2$ ) is created that extends along a length parallel to the axis of translation (T) and at least equal to the travel to be measured (C) of the cellular phone, the variable air gap (4) being capable of allowing the linear movement of the cellular phone (2) which is equipped with means (5) for modifying the reluctance of said variable air gap, mechanically independent of said sensor;

and a measurable air gap (7) to which the measuring cell is fitted.

2. (currently amended) Magnetic sensor according to claim 1, ~~characterised in that~~ wherein the magnetic circuit (3) delimits a variable air gap (4) within which a first magnetic induction ( $I_1$ ) is created that extends along a given length ( $Z_1$ ) parallel to the axis of translation (T) and along a direction perpendicular to the axis and a second magnetic induction ( $I_2$ ) extending along the

side of the first induction ( $I_1$ ), along a given length ( $Z_2$ ) parallel to the axis of translation and along an opposite direction to the first induction, the sum of the lengths ( $Z_1$ ,  $Z_2$ ) being at least equal to the travel to be measured (C) of the cellular phone.

3. (currently amended) Magnetic sensor according to claim 1, ~~characterised in that at least one and preferably the two pole pieces (8) are equipped with a magnet (11, 12) creating~~ wherein the magnetic induction along a direction perpendicular to the axis is created by at least one pole piece (8) equipped with a magnet (11, 12).

4. (currently amended) Magnetic sensor according to claim 1, ~~characterised in that~~ wherein the variable air gap (4) allows ~~to displace~~ displacement of the cellular phone (2) ~~whose~~ having means for modifying the reluctance (5) ~~are constituted by~~ comprising the parts ( $5_1$ ,  $5_2$ ) of the cellular phone that have sections of different values.

5. (currently amended) Magnetic sensor according to claim 4, ~~characterised in that~~ wherein the variable air gap (4) allows ~~to displace~~ displacement of the cellular phone (2) ~~whose~~ having means for modifying the reluctance (5) ~~are constituted by~~ comprising the terminal part ( $2_1$ ) of the cellular phone (2) delimited by its free end.

6. (currently amended) Magnetic sensor according to claim 4, ~~characterised in that~~ wherein the variable air gap (4) allows ~~to displace~~ displacement of the cellular phone (2) ~~whose~~ having means for modifying the reluctance (5) ~~are constituted by~~ comprising the parts that each have a revolution section.

7. (currently amended) Magnetic sensor according to claim 4, ~~characterised in that~~ wherein the variable air gap (4) allows ~~to displace~~ displacement of the cellular phone (2) ~~whose~~ having means for modifying the reluctance (5) ~~are~~ formed by the zones

(2<sub>1</sub>, 5<sub>1</sub>, 5<sub>2</sub>) with sections of constant value in order to obtain a linear response from the sensor.

8. (currently amended) Magnetic sensor according to claim 4, ~~characterised in that~~ wherein the variable air gap (4) allows to ~~displace~~ displacement of the cellular phone (2) ~~whose~~ having means for modifying the reluctance (5) ~~are~~ formed by at least one zone with sections of non-constant value in order to obtain a non-linear response from the sensor.

9. (currently amended) Magnetic sensor according to claim 5, ~~characterised in that~~ wherein the variable air gap (4) allows to ~~displace~~ displacement of the cellular phone (2) of which one part of the cellular phone (2) is positioned so as to extend at mid-travel, symmetrically in relation to the tie line (L) between the two zones (Z<sub>1</sub>, Z<sub>2</sub>) of magnetic induction in opposite directions.

10. (currently amended) Magnetic sensor according to claim 5, ~~characterised in that~~ wherein the variable air gap (4) allows to ~~displace~~ displacement of the cellular phone (2) of which one part of the cellular phone is arranged so that the surface of the junction between said parts (5<sub>1</sub>, 5<sub>2</sub>) of the cellular phone always extend within the induction zone (Z<sub>1</sub>, Z<sub>2</sub>) whilst the cellular phone is ~~travelling~~ traveling.

11. (currently amended) Device for determining the position of a cellular phone (2) in linear movement along an axis of translation (T), ~~characterised in that it comprises~~ comprising:

a sensor ~~(1) according to claim 1~~ comprising:

a magnetic circuit within which at least a magnetic induction (I<sub>1</sub>, I<sub>2</sub>) is created along a direction perpendicular to the axis;

a measuring cell fitted to a magnetic circuit, sensitive to the value of the magnetic induction flux and capable of measuring the variations in the value of the magnetic induction flux consecutive with the reluctance variations of the magnetic

circuit in order to determine the linear position of the cellular phone (2) along the axis of translation (T); and

a single delimiting fixed magnetic circuit between two fixed pole parts, comprising:

a variable air gap (4) within which at least a magnetic induction ( $I_1$ ,  $I_2$ ) is created that extends along a length parallel to the axis of translation (T) and at least equal to the travel to be measured (C) of the cellular phone, the variable air gap (4) being capable of allowing the linear movement of the cellular phone (2) which is equipped with means (5) for modifying the reluctance of said variable air gap, mechanically independent of said sensor;

and a measurable air gap (7) to which the measuring cell is fitted;

and means for modifying the reluctance (5) fitted to the cellular phone (2).

  
JOSEPH FEILD  
SUPERVISORY FACILITY EXAMINER